PATENT COOPERATION TR TY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 05 July 2000 (05.07.00)	
International application No. PCT/SE99/02119	**Applicant's or agent's file reference** 2006164
International filing date (day/month/year) 18 November 1999 (18.11.99)	**Priority date** (day/month/year) 18 November 1998 (18.11.98)
Applicant HAEGGSTRÖM, Jimmy	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

06 June 2000 (06.06.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Manu Berrod
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

14

Applicant's or agent's file reference 2006164	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/SE99/02119	International filing date *(day month year)* 18.11.1999	Priority date *(day month year)* 18.11.1998
International Patent Classification (IPC) or national classification and IPC7 G06F 15/02, G06F 3/00		
Applicant AUTOIDENT LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
06.06.2000	19.02.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Jan Silfverling/LR Telephone No. 08-782 25 00

Form PCT/IPEA/409 (cover sheet) (January 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/SE99/02119

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:
pages 1-6 , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☒ the claims:
pages 7-9 , as originally filed
pages _____ , as amended (together with any statement) under article 19
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☒ the drawings:
pages _____ , as originally filed
pages 1 , filed with the demand
pages _____ , filed with the letter of _____

☐ the sequence listing part of the description:
pages _____ , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/SE99/02119

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-14	YES
	Claims		NO
Inventive step (IS)	Claims	1-14	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The invention relates to a mobile registration unit intended for wireless communication with an information carrier and comprises a mobile processing unit. The registration unit further comprises a registration module, which is adapted to be received in a space for memory expansion in the mobile processing unit. The communication between the information carrier and the mobile processing unit is effected by means of radio waves via the registration module.

Document cited in the International Search Report:

D1: EP 0629071
D2: US 5142128
D3: EP 0526688
D4: WO 9816070
D5: WO 9825248

The documents D1-D5 were only cited to show the state of the art. Therefore, the invention according to claims 1-14 is considered to be novel and to have inventive step and industrial applicability.

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : G06F 15/02, 3/00

A1

(11) International Publication Number: WO 00/29967

(43) International Publication Date: 25 May 2000 (25.05.00)

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(22) International Filing Date: 18 November 1999 (18.11.99)

(30) Priority Data:
9803975-3 18 November 1998 (18.11.98) SE

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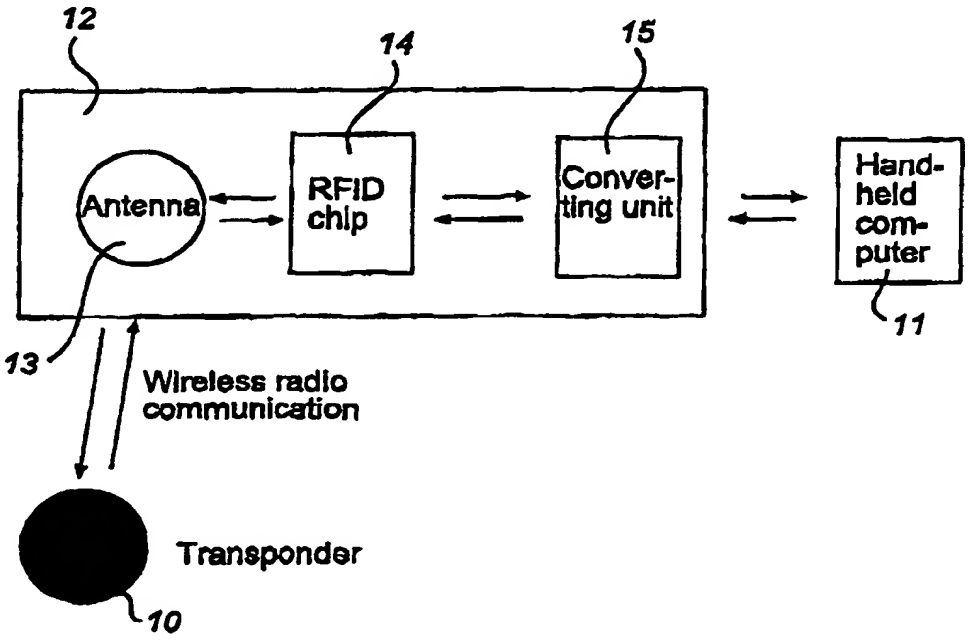
Published

With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

In English translation (filed in Swedish).

(54) Title: REGISTRATION UNIT



(57) Abstract

The invention relates to a registration unit for contactless communication between an information carrier (10) and a mobile unit (11). The invention enables safe identification with mobile equipment, which has previously been difficult to perform owing to size, price, unwieldy shape and functionality. This is achieved by the communication between the information carrier and the mobile unit taking place by means of radio waves, via a module (12) which is accommodated in a space for memory expansion in the mobile unit (11).

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REGISTRATION UNIT

Field of the Invention

The present invention relates to a registration unit intended for wireless communication with an information carrier, such as a transponder, and comprising a mobile unit. The invention further relates to a registration module for wireless communication with an information carrier, said module being connectible with another mobile unit.

Background Art

In mobile identification equipment, size is an essential factor, and it is desirable to reduce the size of the units included as much as possible. Identification equipment available today usually comprise a hand-held computer with an accessory module for wireless communication between the identification unit and an information carrier, such as a transponder. As a result, they will be large and unwieldy and not ergonomically designed. The accessory modules usually have a separate plastic casing which must be adapted to each hand-held computer and be attached to the same.

A further problem of today's identification equipment is that it is often necessary for the hand-held computer to participate in the identification process. For example, lists of approved transponders must be stored and searched in the hand-held computer. This results in the hand-held computer being prevented from performing other tasks during identification.

Moreover, separate output ports of the hand-held computer are normally required to allow the accessory module to be connected. As a rule, a serial interface and an RS232 plug are used.

Object of the Invention

An object of the present invention therefore is to provide a registration unit which makes it possible to read and write information to/from data carriers with both simple and advanced mobile equipment, and which wholly, or at least partly, solves the above problems of prior-art technique.

This object is achieved by a registration unit and a registration module according to the appended claims.

By means of the registration unit and the registration module according to the invention, a combination of wireless identification with the aid of RFID (Radio Frequency IDentification) and a bar code will now be possible without necessitating reading of one at a time and changing of the accessory module between readings, which is necessary in currently used equipment. Thus, simultaneous reading of, for instance, transponders and bar codes can be effected by arranging a registration unit according to the invention in the space for memory expansion of a hand-held computer equipped for bar code reading. Besides, most hand-held computers have two internal spaces for an additional memory, one space being usable to receive a registration module while the other can be used to receive an additional memory unit.

By arranging the registration module in the space for memory expansion of the mobile processing unit, the size of the registration unit will be minimised. Moreover, the connection of the registration module can be made simple by the ports that are intended for the additional memory being used for communication between the registration module and the processing unit.

It is also an advantage of the invention that it enables integration of the hand-held computer and the registration module, which in turn renders it possible to avoid or minimise the need for cabling, which increases the reliability of the system. Safe identification by means of transponders will thus be possible

with mobile equipment, which was previously difficult to perform owing to size, price, unwieldy shape and functionality.

Brief Description of the Drawings

The invention will be described below in more detail by way of an embodiment and with reference to the accompanying drawing, which in a block diagram schematically shows a system with a registration module designed according to the invention.

Description of Preferred Embodiments

The registration unit according to the invention suitably comprises a registration module 12 of RFID type, i.e. Radio Frequency IDentification. With the aid of this module, a reading/writing function is obtained for data carriers (e.g. transponders) with mobile units such as hand-held computers. The registration module, however, can also be adapted to other forms of wireless communication by means of radio waves. Preferably, however, it is adapted to communicate with an information carrier 10 which consists of a mobile unit which can store information and preferably which consists of a passive unit operated by energy which is transmitted in a wireless manner by the registration unit. It is also possible to employ information carriers using a battery or other internal energy sources within the scope of the invention.

The RFID module is adapted to be connected to a hand-held mobile unit 11 (e.g. a computer, a telephone or a combination thereof), which can accommodate at least one additional memory module. The registration module thus provides the mobile unit 11 with a reading/writing function for exchange of information to/from data carriers (e.g. transponders) in a contactless manner by means of radio waves (e.g. RFID technique).

The RFID module is intended for use inside the mobile unit and is preferably formed as a small but thick credit card which is inserted into the mobile unit, such as a hand-held computer. Consequently, the RFID module will not be visible in normal use and thus does not affect the total size of the registration unit.

The RFID module is preferably connected to the connections that are intended for memory expansion to establish communication between the registration module and the mobile unit. Moreover, the power supply of the module is preferably obtained via the same connecting means which provides communication to the hand-held computer/ mobile unit and which is, for example, a 6-pole connector. Preferably, the registration modules emulates a memory to the processing unit, which will see the registration module as an additional memory and also communicate with the same as if it were a conventional memory.

A casing for the registration module is suitably made of, for instance, plastic. The dimensions may vary but the casing can advantageously be designed as, for instance, SSD (Solid State Disk) memories, the size of which is 64*42*6mm, or as compact flash memories which are a standard for memory modules in hand-held units.

The RFID module 12 may comprise, for example, an aerial or antenna 13, a radio communication part 14 for receiving and transmitting radio signals and a converting unit 15 to enable communication between the radio communication part and the processing unit 11. The aerial 13 can be used to receive and transmit radio waves and thus serves as an interface against the information carriers 10. The radio communication part can be, for example, a passive part, such an RFID chip, which is used to control the aerial and/or to generate signals to the aerial. The converting unit 15 preferably comprises a one-chip computer or the like as well as a converting part. The one-chip computer is the active part which controls the radio communication part so that the correct

function is achieved. The converting part can be a stand-alone part or be included as part of the one-chip computer and serves to adapt the output signal from the one-chip computer to the surroundings, for example to emulate a RAM memory (Random Access Memory). All the parts included in the RFID module can advantageously be arranged, and preferably soldered, on a common printed board. The RFID module further comprises preferably at least one connecting means to physically connect the module to the processing unit for transmitting signals therebetween. The parts included in the RFID module can also be combined to one or more chips having similar functions.

The module can also be supplemented with memory modules to obtain a combined smart unit, which, for instance, can store information about which transponders are approved in the specific application and only inform the hand-held computer when an approved (according to numbers stored) transponder is available in the reading area of the module, the transponder communicating with the hand-held computer via the module, for identification, logging of number, time and date, whereupon the hand-held computer can take a preprogrammed action if any. This can also be an electricity-saving function towards the battery supply of the hand-held computer since the RFID module takes care of the decoding even before the hand-held computer would otherwise have received the transponder number, which promotes a faster process and simpler and faster software in the hand-held computer/ mobile unit. Rapidity is an important aspect of hand-held computers, and if the check of the transponder number is handled in the RFID module, a larger processor capacity for the actual application in the hand-held computer is made available.

The registration module described above can be used in many fields: for instance, marking in service, industry; passage control of pallets, hoists, robots, machi-

nery, animals, departing/arriving goods; stock-handling, charging; identification at predetermined locations for reading of metering points, e.g. water, electricity, gas, oil, pressure, flow rate and registration of measured values. Additional fields of application are messengers for delivering documents and parcels, identification and registration of mud collectors, lorry weighers, computers, tarpaulins, tents, canoes, pallets (wood and metal), paintings, trees, mobile phones etc. Furthermore the invention can be used by real-estate security officers for confirmation of attendance.

The invention is not limited to the above embodiments, and several variants are conceivable within the scope of the appended claims. For example, the module can be provided with a memory.

CLAIMS

1. A mobile registration unit intended for wireless communication with an information carrier (10), and comprising a mobile processing unit (11), characterised in that it further comprises a registration module (12), which is adapted to be received in a space for memory expansion in the mobile processing unit (11), the communication between the information carrier (10) and the mobile processing unit (11) being effected by means of radio waves via the registration module (12).

2. A registration unit as claimed in claim 1, characterised in that the mobile processing unit (11) consists of a hand-held computer, mobile telephone, pocket diary or a combination thereof, which is provided with a microprocessor.

3. A registration unit as claimed in claim 1 or 2, characterised in that it is adapted to communicate with an information carrier (10) which consists of a mobile unit capable of storing information, and preferably which consists of a passive unit operated by energy which is transmitted in a wireless manner by the registration unit.

4. A registration unit as claimed in any one of claims 1-3, characterised in that the registration module (12) comprises an aerial (13), a radio communication part (14) with a control part for the radio communication and a converting part (15) for conversion of a signal received from the information carrier into a signal usable by the processing unit.

5. A registration unit as claimed in claim 4, characterised in that the registration module further comprises memory means for storing of information, and comparing means for comparing a signal received from an information carrier with information stored in the memory means.

6. A registration unit as claimed in any one of the preceding claims, c h a r a c t e r i s e d in that it further comprises means for reading bar codes.

7. A registration unit as claimed in any one of the preceding claims, c h a r a c t e r i s e d in that the registration module is adapted to be completely accommodated in the space for memory expansion in the mobile processing unit (11).

8. A registration unit as claimed in any one of the preceding claims, c h a r a c t e r i s e d in that the registration modules emulates a memory to the processing module, the processing unit communicating with the registration module in the same way as with a conventional memory.

9. A registration unit as claimed in claim 8, c h a r a c t e r i s e d in that the registration module emulates a flash memory or an SSD (Solid State Disk) memory to the processing unit.

10. A registration module (12) for wireless communication with an information carrier (10), c h a r a c t e r i s e d in that it is adapted to communicate with the information carrier (10) by means of radio waves, and that it is designed to be accommodated in a space for memory expansion in a mobile processing unit (11).

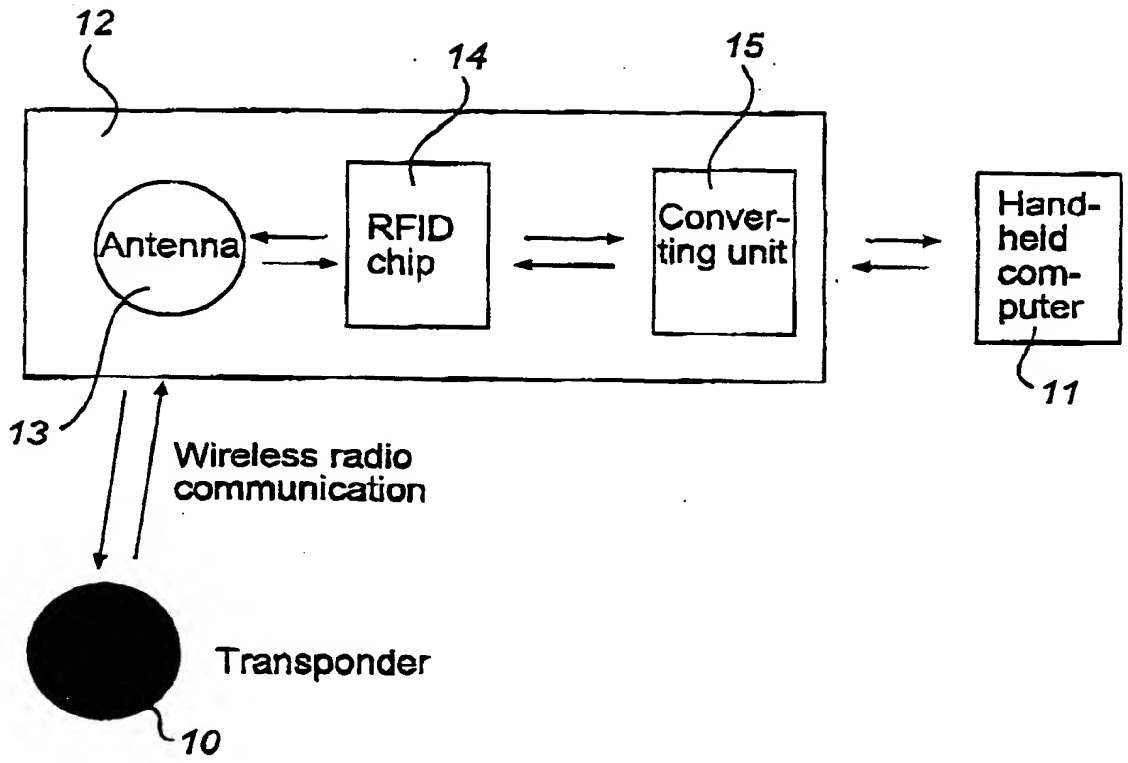
11. A registration module as claimed in claim 10, c h a r a c t e r i s e d in that it is adapted to communicate with an information carrier (10) which consists of a mobile unit capable of storing information, and preferably which consists of a passive unit operated by energy which is transmitted in a wireless manner by the registration unit.

12. A registration module as claimed in claim 10 or 11, c h a r a c t e r i s e d in that the registration module (12) comprises an aerial (13), a radio communication part (14) with a control part for the radio communication and a converting part (15) for converting a sig-

nal received from an information carrier into a signal usable by the processing unit.

13. A registration module as claimed in claim 12, c h a r a c t e r i s e d in that the registration module further comprises memory means for storing information, and comparing means for comparing a signal received from an information carrier with information stored in the memory means.

14. A registration module as claimed in any one of claims 10-13, c h a r a c t e r i s e d in that it is adapted to emulate a memory to the processing module, the processing unit communicating with the registration module in the same way as with a conventional memory.


12
14
15
Antenna
RFID chip
Conver-ting unit
Hand-held com-puter
11
13
Wireless radio communication
Transponder
10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 99/02119

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06F 15/02, G06F 3/00
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0629071 A1 (AT & T GLOBAL INFORMATION SOLUTIONS INTERNATIONAL INC.), 14 December 1994 (14.12.94) --	1-14
A	US 5142128 A (GREGG S. PERKIN ET AL), 25 August 1992 (25.08.92) --	1-14
A	EP 0526688 A2 (ROBERT BOSCH GMBH), 10 February 1993 (10.02.93) --	1-14
A	WO 9816070 A1 (AMTECH CORPORATION), 16 April 1998 (16.04.98) --	1-14

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" erlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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"P" document published prior to the international filing date but later than the priority date claimed
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"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 March 2000	06 -04- 2000
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Jan Silfverling/CL Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 99/02119

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9825248 A1 (MICRON COMMUNICATIONS, INC.), 11 June 1998 (11.06.98) -- --------	1-14

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

International application No.
PCT/SE 99/02119

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0629071 A1	14/12/94	JP 7143250 A	02/06/95
US 5142128 A	25/08/92	AT 161987 T	15/01/98
		CA 2081908 A	05/11/91
		DE 69128620 D,T	20/05/98
		DK 527890 T	09/02/98
		EP 0527890 A,B	24/02/93
		NO 300298 B	05/05/97
		US 5360967 A	01/11/94
		WO 9117514 A	14/11/91
EP 0526688 A2	10/02/93	DE 4125874 A	11/02/93
		FI 921318 A	06/02/93
		JP 5199174 A	06/08/93
WO 9816070 A1	16/04/98	EP 0953256 A	03/11/99
WO 9825248 A1	11/06/98	AU 5375398 A	29/06/98
		EP 0941532 A	15/09/99

RECORD COPY

PCT
REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty

For receiving Office use only

PCT/SE 99/02119

International Application No.

International Filing Date 18 -11- 1999

The Swedish Patent Office
PCT International Application

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference *(if desired)(12 characters maximum)* 2006164

Box No. I TITLE OF INVENTION

REGISTRATION UNIT

Box No. II APPLICANT

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

Autoident Limited
4th Floor, Palladium House
1-4 Argyll Street
London W1V 1AD
STORBRITANNIEN

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State *(that is, country)* of nationality: GB

State *(that is, country)* of residence: GB

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR /FURTHER INVENTOR(S)

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

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This person is:

☐ applicant only
☒ applicant and inventor
☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: SE

State *(that is, country)* of residence: SE

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

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☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent

Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) *(mark the applicable check-boxes; at least one must be marked)*:

Regional Patent

☒ **AP** **ARIPO Patent:** **GH** Ghana, **GM** Gambia, **KE** Kenya, **LS** Lesotho, **MW** Malawi, **SD** Sudan, **SL** Sierra Leone, **SZ** Swaziland, **UG** Uganda, **ZW** Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT

☒ **EA** **Eurasian Patent:** **AM** Armenia, **AZ** Azerbaijan, **BY** Belarus, **KG** Kyrgyzstan, **KZ** Kazakhstan, **MD** Republic of Moldovia, **RU** Russian Federation, **TJ** Tajikistan, **TM** Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT

☒ **EP** **European Patent:** **AT** Austria, **BE** Belgium, **CH and LI** Switzerland and Liechtenstein, **CY** Cyprus, **DE** Germany, **DK** Denmark, **ES** Spain, **FI** Finland, **FR** France, **GB** United Kingdom, **GR** Greece, **IE** Ireland, **IT** Italy, **LU** Luxembourg, **MC** Monaco, **NL** Netherlands, **PT** Portugal, **SE** Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT

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National Patent *(if other kind of protection or treatment desired, specify on dotted line)*:

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☒	**AL**	Albania	☒	**LS**	Lesotho
☒	**AM**	Armenia	☒	**LT**	Lithuania
☒	**AT**	Austria +Utility Model	☒	**LU**	Luxembourg
☒	**AU**	Australia	☒	**LV**	Latvia
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☒	**BA**	Bosnia and Herzegovina	☒	**MG**	Madagascar
☒	**BB**	Barbados	☒	**MK**	The former Yugoslav Republic of Macedonia
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☒ **DM** Dominica ☒ **MA** Morocco

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.*(Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)*

Box No. VI PRIORITY CLAIM ☐ Further priority claims are indicated in the Supplement Box.

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is: national application: country	regional application:* regional Office	international application: receiving Office
item (1) 18 November 1998	9803975-3	Sweden		
item (2)				
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office)* identified above as item(s): 1

* *Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.*

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) *(If two or more International Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):*

ISA / SE

Request to use results of earlier search; reference to that search *(if an earlier search has been carried out by or requested from the International Searching Authority):*

Date *(day/month/year)* Number Country *(or regional Office)*

Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following **number of sheets:**

request	: 3
description (excluding sequence listing part)	: 6
claims	: 3
abstract	: 1
drawings	: 1
sequence listing part of description	:
Total number of sheets	: 14

This international application is **accompanied by** the item(s) marked below:

1. ☒ fee calculation sheet
2. ☒ separate signed power of attorney
3. ☐ copy of general power of attorney; reference No., if any:
4. ☐ statement explaining lack of signature
5. ☐ priority document(s) identified in Box No. VI as item(s):
6. ☐ translation of international applications into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listning in computer readable form
9. ☒ other (specify): Subauthorisation

Figure of the drawings which should accompany the abstract: 1

Language of filing of the international application: Swedish

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

Göteborg 16 November 1999

Urban Lind

Authorised Representative

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1. Date of actual receipt of the Purported international application: 18 -11- 1999		2. Drawings: ☒ received: ☐ not received:
3. Corrected date of actual receipt due to later but Timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required Corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA/ SE	6. ☐ Transmittal of search copy delayed until search fee is paid.	

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Date of receipt of the record copy by the International Bureau: 20 JANUARY 2000 (20.01.00)

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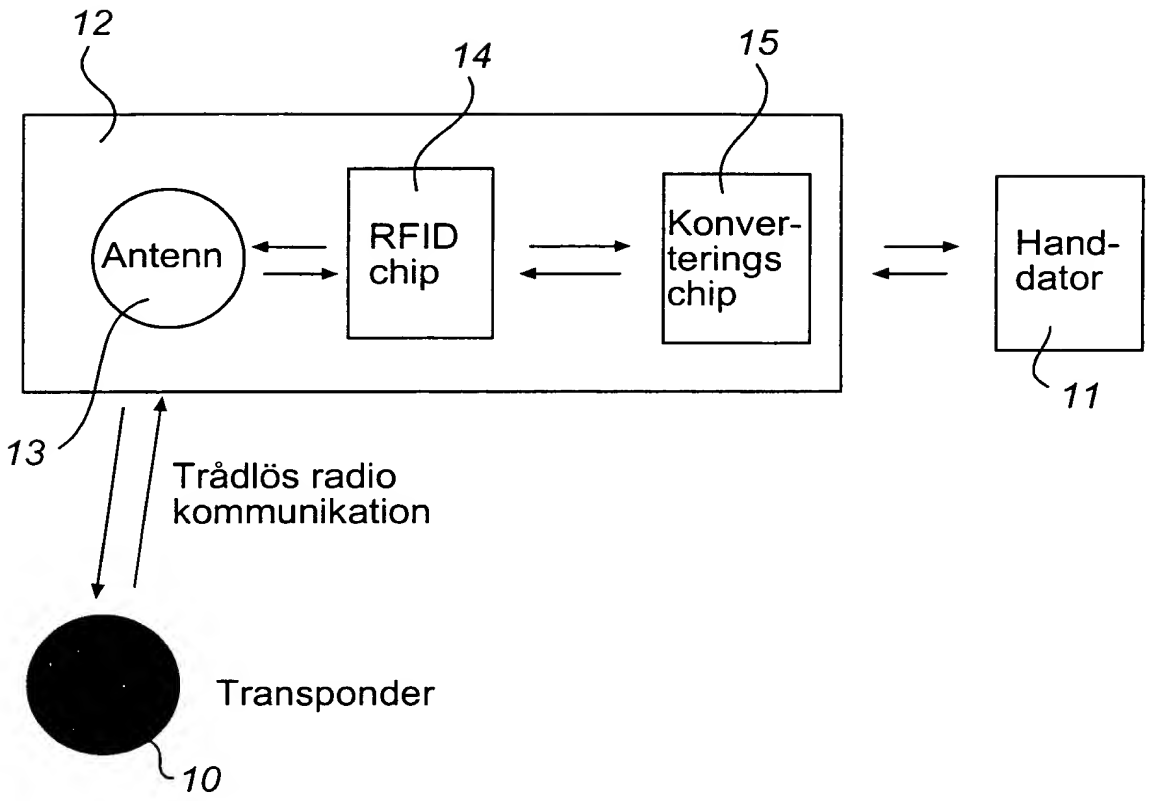
12
14
15
Antenn
RFID chip
Konver-terings chip
Hand-dator
11
13
Trådlös radio kommunikation
Transponder
10

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Ansökningsnr 9803975-3
Vår referens SE-2006101

REGISTRERINGSANORDNING

Teknikområde

Föreliggande uppfinning hänför sig till en registreringsanordning för trådlös kommunikation med en informationsbärare, såsom en transponder, och omfattande en mobil enhet. Uppfinningen hänför sig vidare till en registreringsmodul för trådlös kommunikation med en informationsbärare, vilken modul kan sammankopplas med en annan mobil enhet.

Bakgrund

I mobila identifieringsutrustningar är storlek en väsentlig faktor, och det är önskvärt att i största möjliga mån minska storleken hos de ingående enheterna. Dagens identifieringsutrustningar omfattar vanligen en handdator samt en tillsatsmodul för trådlös kommunikation mellan identifieringsenheten och en informationsbärare, t.ex. en transponder. Därigenom blir de stora och klumpiga och ej ergonomiskt utformade. Tillsatsmodulerna har vanligen ett separat plasthölje som måste anpassas till respektive handdator, samt göras fast vid detsamma.

Det är vidare ett problem med dagens identifieringsutrustningar att det ofta krävs att handdatorn är delaktig i identifieringsprocessen. Exempelvis måste listor på godkända transponders lagras och genomsökas i handdatorn. Detta leder till att handdatorn under identifieringen förhindras att utföra andra uppgifter.

Det krävs vidare normalt separata utgångsportar från handdatorn för att kunna ansluta tillsatsmodulen. Vanligtvis används ett seriellt gränssnitt och en RS232 kontakt.

Uppfinningens syfte

Ett ändamål med föreliggande uppfinning är därför att åstadkomma en registreringsanordning som gör det möjligt att läsa och skriva information till/från databärare med både enkla och avancerade mobila utrustningar, och som helt, eller åtminstone delvis, löser de ovan relaterade problemen med den kända tekniken.

Detta syfte uppnås medelst en registreringsanordning och en registreringsmodul enligt de bifogade patentkraven.

Medelst registreringsanordningen och registreringsmodulen enligt uppfinningen blir en kombination av trådlös identifiering medelst RFID (Radio Frequency IDentification) och streckkod nu möjlig utan att behöva läsa en sak i taget och byta tillsatsmodul mellan läsningarna, vilket krävs i dagens utrustningar. Sålunda möjliggörs samtidig läsning av exempelvis transponders och streckkoder genom att anordna en registreringsanordning enligt uppfinningen i utrymmet för minnesexpansion hos en handdator utrustad för streckkodsläsning. Dessutom har de flesta handdatorer två invändiga utrymmen för tillsatsminne, varvid det ena utrymmet kan utnyttjas för att uppta en registreringsmodul, medan det andra kan användas för upptagning av en ytterligare minnesenhet.

Genom att anordna registreringsmodulen i utrymmet för minnesexpansion hos den mobila bearbetningsenheten kommer storleken hos registreringsanordningen att minimeras. Dessutom kan anslutningen av registreringsmodulen göras enkel, genom att anslutningsportarna som är avsedda för det ytterligare minnet används för kommunikation mellan registreringsmodulen och den bearbetande enheten.

Det är vidare en fördel med uppfinningen att den möjliggör en integrering av handdatorn och registreringsmodulen, vilket i sin tur gör det möjligt att undvika eller minimera behovet av kablage, vilket ökar systemets tillförlitlighet. Säker identifiering med hjälp av transponders blir därmed möjlig med mobil utrustning, vilket

(Random Access Memory). Alla de ingående delarna i RFID-modulen kan med fördel vara anordnade, och företrädevis fastlödade, på ett gemensamt mönsterkort. RFID-modulen omfattar vidare företrädesvis åtminstone ett kontaktdon för att fysiskt ansluta modulen med den bearbetande enheten för överförande av signaler däremellan. De ingående delarna i RFID-modulen kan även kombineras tillsammans till ett eller flera chip med likartade funktioner.

Modulen kan även kompletteras med minnesmoduler för att få en kombinerad "smart" enhet, vilken exempelvis kan lagra information om vilka transponders som är godkända i den specifika applikationen och endast meddela handdatorn när godkänd (enligt lagrade nummer) transponder finns i modulens läsområde, varvid transpondern kommunicerar med handdatorn via modulen, för identifiering, loggning av nr tid och datum, varefter handdatorn kan utföra en eventuell förprogrammerad åtgärd. Detta kan också vara en strömsparande funktion gentemot handdatorns batteriförsörjning, eftersom RFID-modulen tar hand om avkodningen redan innan handdatorn annars skulle fått in transpondernumret, vilket bidrar till ett snabbare förlopp och enklare och snabbare programvara i handdatorn/mobila enheten. Snabbheten är en viktig aspekt på handdatorer och om kontrollen av transpondernummer hanteras i RFID-modulen, så frigörs mer processorkapacitet åt den faktiska tillämpningen i handdatorn.

Den ovan beskrivna registreringsmodulen kan användas inom många områden: exempelvis uppmärkning, service, industri; passage-, pallar, hissar, robotar, maskiner, djur, avgående/inkommande gods, lagerhantering, debitering; identifiering vid bestämda platser för avläsning av mätpunkter tex. vatten, el, gas, olja, tryck, flöde och registrering av mätvärden. Ytterligare användningsområden är distributionsbud för utkörning av dokument och paket, identifiering och registrering av slambrunnar fordonsvågar, datorer, presenningar, tält, kanoter, pallar (trä & metall), tavlor, träd, mobiltelefoner med mera. Vidare

kan uppfinningen användas av fastighetsväktare för närvarobekräftelse.

Uppfinningen är ej begränsad till de ovan beskrivna utföringsexemplen, utan flera varianter är tänkbara inom ramen för efterföljande krav. Exempelvis kan modulen förses med minne.

tidigare har varit svårt att genomföra på grund av storlek, pris, klumpighet och funktionalitet.

Kort beskrivning av ritningarna

Uppfinningen kommer nedan att beskrivas mer ingående med hjälp av ett utföringsexempel, och med hänvisning till den bifogade ritningen, vilken i ett blockschema schematiskt visar ett system med en enligt uppfinningen utformad registreringsmodul.

Beskrivning av föredragna utföringsformer

Lämpligen omfattar en registreringsanordning enligt uppfinningen en registreringsmodul 12 av RFID-typ, dvs. Radio Frequency IDentification. Med hjälp av denna modul erhålles läs/skrivfunktion för databärare (tex. transponders) med mobila enheter tex. handdator. Registreringsmodulen kan dock även vara avpassad för andra former av trådlös kommunikation medelst radiovågor. Företrädesvis är den dock inrättad att kommunicera med en informationsbärare 10 som utgörs av en mobil enhet som kan lagra information, och företrädesvis som utgörs av en passiv enhet som drivs av energi som trådlöst utsänds av registreringsanordningen. Informationsbärare som använder batteri eller andra interna energikällor är också möjliga att använda inom ramen för uppfinningen.

RFID-modulen är avpassad att anslutas till en handhållen, mobil enhet 11 (tex. en dator, en telefon eller en kombination därav) vilken har plats för åtminstone en ytterligare minnesmodul. Registreringsmodulen förser härigenom den mobila enheten 11 med läs/skriv funktion för utbyte av information till/från databärare (tex. transponders) beröringsfritt med hjälp av radiovågor (tex. RFID teknik).

RFID-modulen är ämnad att användas inuti den mobila enheten och den är företrädesvis utformad som ett mindre men tjockare kreditkort som sticks in i den mobila enheten, tex. en handdator. RFID-modulen kommer härigenom

alltså inte att synas vid normalt användande, och påverkar sålunda inte den totala storleken av registreringsanordningen.

RFID-modulen ansluts företrädesvis till de anslutningar som är avsedda för minnesexpansion för att upprätta kommunikation mellan registreringsmodulen och den mobila enheten. Vidare tillhandahålls företrädesvis modulens strömförsörjning via samma kontaktdon som ger kommunikation till handdator/mobila enheten, och som tex. är en 6 polig kontakt. Företrädesvis emulerar registreringsmodulen ett minne till den bearbetande enheten, varvid den bearbetande enheten kommer att se registreringsmodulen som ett ytterligare minne och även kommunicera med den som om den vore ett konventionellt minne.

En kapsling för registreringsmodulen är lämpligen utförd i tex. plast. Dimensionerna kan variera men kapslingen kan med fördel vara utförd som exempelvis SSD (Solid State Disk) minne vilka är 64*42*6mm stora, eller som "Compact Flash" minnen som är en standard för minnes moduler inom handhållna enheter.

RFID-modulen 12 kan exempelvis omfatta en antenn 13, en radiokommunikationsdel 14 för mottagande och sändande av radiosignaler samt en konverteringsenhet 15 för att möjliggöra kommunikation mellan radiokommunikationsdelen och den bearbetande enheten 11. Antennen 13 används för att mottaga och sända radiovågor, och fungerar sålunda som gränsnitt mot informationsbärarna 10. Radiokommunikationsdelen kan exempelvis vara en passiv del, såsom ett RFID-chip, som används för att styra antennen och/eller att generera signaler till antennen. Konverteringsenheten 15 omfattar företrädesvis en enchipsdator eller liknande samt en konverteringsdel. Enchipsdatorn är den aktiva delen som styr radiokommunikationsdelen så att rätt funktion uppnås. Konverteringsdelen kan vara en fristående del eller ingå som en del i enchipsdatorn, och har till uppgift att anpassa utsignalen ifrån enchipsdatorn till omvärlden, till exempel för att emulera ett RAM-minne

PATENTKRAV

1. Mobil registreringsanordning avpassad för trådlös kommunikation med en informationsbärare (10), och omfattande en mobil bearbetningsenhet (11), k ä n n e t e c k n a d av att den vidare omfattar en registreringsmodul(12), vilken är inrättad att upptas i ett utrymme för minnesexpansion i den mobila bearbetningsenheten (11), varvid kommunikationen mellan informationsbäraren (10) och den mobila bearbetningsenheten (11) sker medelst radiovågor via registreringsmodulen (12).

2. Registreringsanordning enligt patentkrav 1, k ä n n e t e c k n a d av att den mobila bearbetningsenheten(11) utgörs av en handdator, mobiltelefon, fickalmanacka eller kombination därav, vilken är utrustad med en mikroprocessor.

3. Registreringsanordning enligt något av föregående patentkrav, k ä n n e t e c k n a d av att den är inrättad att kommunicera med en informationsbärare (10) som utgörs av en mobil enhet som kan lagra information, och företrädesvis som utgörs av en passiv enhet som drivs av energi som trådlöst utsänds av registreringsanordningen.

4. Registreringsanordning enligt något av kraven 1-6, k ä n n e t e c k n a d av att registreringsmodulen (12) omfattar en antenn (13), en radiokommunikationsdel (14) med styrdel för radiokommunikationen och en konverteringsdel (15) för konvertering av en från informationsbäraren mottagen signal till en av bearbetningsenheten användbar signal.

5. Registreringsanordning enligt patentkrav 4, k ä n n e t e c k n a d av att registreringsmodulen vidare omfattar minnesorgan för lagrande av information, samt jämförande organ för jämförande av en från en informationsbärare mottagen signal med i minnesorganet lagrad information.

6. Registreringsanordning enligt något av ovanstående patentkrav, k ä n n e t e c k n a d av att den vidare omfattar organ för läsande av streckkoder.

7. Registreringsanordning enligt något av ovanstående patentkrav, k ä n n e t e c k n a d av att registreringsmodulen är avpassad att fullständigt upptas i utrymme för minnesexpansion i den mobila bearbetningsenheten (11).

8. Registreringsanordning enligt något av ovanstående patentkrav, k ä n n e t e c k n a d av att registreringsmodulen emulerar ett minne till bearbetningsmodulen, varvid bearbetningsenheten kommunicerar med registreringsmodulen såsom med ett konventionellt minne.

9. Registreringsanordning enligt patentkrav 8, k ä n n e t e c k n a d av att registreringsmodulen emulerar ett flashminne eller ett SSD (Solid State Disk) minne till bearbetningsenheten.

10. Registreringsmodul (12) för trådlös kommunikation med en informationsbärare (10), k ä n n e t e c k n a d av att den är avpassad att kommunicera med informationsbäraren (10) medelst radiovågor, samt att den är utformad att upptas i ett utrymme för minnesexpansion i en mobil bearbetningsenhet (11).

11. Registreringsmodul enligt patentkrav 10, k ä n n e t e c k n a d av att den är inrättad att kommunicera med en informationsbärare (10) som utgörs av en mobil enhet som kan lagra information, och företrädesvis som utgörs av en passiv enhet som drivs av energi som trådlöst utsänds av registreringsanordningen.

12. Registreringsmodul enligt något av kraven 10 eller 11, k ä n n e t e c k n a d av att registreringsmodulen (12) omfattar en antenn (13), en radiokommunikationsdel (14) med styrdel för radiokommunikationen och en konverteringsdel (15) för konvertering av en från en informationsbärare mottagen signal till en av bearbetningsenheten användbar signal.

13. Registreringsmodul enligt patentkrav 12, k ä n n e t e c k n a d av att registreringsmodulen vidare omfattar minnesorgan för lagrande av information, samt jämförande organ för jämförande av en från en informationsbärare mottagen signal med i minnesorganet lagrad information.

14. Registreringsmodul enligt något av patentkraven 10-13, k ä n n e t e c k n a d av att den är avpassad att emulera ett minne till bearbetningsmodulen, varvid bearbetningsenheten kommunicerar med registreringsmodulen såsom med ett konventionellt minne.

SAMMANDRAG

Uppfinningen avser en registreringsanordning för beröringsfri kommunikation mellan en informationsbärare (10) och en niobil enhet (11). Härvid möjliggör uppfinningen säker identifiering med mobil utrustning, vilket tidigare har varit svårt att genomföra på grund av storlek, pris, klumpighet och funktionalitet. Detta åstadkommes genom att kommunikationen mellan informationsbäraren och den mobila enheten sker medelst radiovågor, via en modul (12) som upptas i ett utrymme för minnesexpansion i den mobila enheten (11).